

**The Hardware Refreshment Program  
Is Generally Effective, But Improvements  
Can Be Made**

**September 2002**

**Reference Number: 2002-20-160**

**This report has cleared the Treasury Inspector General for Tax Administration disclosure review process and information determined to be restricted from public release has been redacted from this document.**



DEPARTMENT OF THE TREASURY  
WASHINGTON, D.C. 20220

INSPECTOR GENERAL  
for TAX  
ADMINISTRATION

September 11, 2002

MEMORANDUM FOR DEPUTY COMMISSIONER FOR MODERNIZATION &  
CHIEF INFORMATION OFFICER

*Pamela J. Gardiner*

FROM: Pamela J. Gardiner  
Acting Inspector General

SUBJECT: Final Audit Report - The Hardware Refreshment Program Is  
Generally Effective, But Improvements Can Be Made  
(Audit # 200220040)

This report presents the results of our review of the effectiveness of the Hardware Refreshment Program (HRP).<sup>1</sup>

In summary, by the end of Fiscal Year (FY) 2003, the Internal Revenue Service (IRS) expects to have replaced its aging inventory of 150,000 personal computers with approximately 107,000 new (refreshed) personal computers.<sup>2</sup> The Hardware Refreshment Program Office (HRPO) of the End User Equipment and Services Division is responsible for coordinating and overseeing the planning and implementation of the HRP.

In FY 2001, the IRS allocated approximately \$97 million to replace 63,139 personal computers. On May 14, 2001, the IRS held a reverse auction<sup>3</sup> to purchase the replacement computers with installation beginning in FY 2002. The IRS reported that the reverse auction resulted in government savings of 49 percent. The new computers were targeted to replace existing low-end computers with processor speeds less than 400 megahertz. As of June 6, 2002, the IRS had replaced 36,423 (25,875 desktops and 10,548 laptops) of the 63,139 personal computers and plans to replace the

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<sup>1</sup> The IRS-wide initiative to routinely replace aging personal computers (desktop and laptop computers) with state of the market equipment on a continuing replacement cycle (currently, 3 years).

<sup>2</sup> All personal computers will have the same operating system and software applications, except in limited situations when users may require additional software to perform required duties.

<sup>3</sup> Reverse auctions consist of vendors bidding against each other for the purpose of getting the lowest prices on high-quality equipment.

remaining computers before the end of FY 2002. For FYs 2002 and 2003, the IRS budgeted \$86.4 million to purchase and install an additional 45,560 computers by the end of FY 2003.

Overall, the HRPO has done an effective job controlling the hardware replacement process. The HRPO successfully implemented several program management activities such as preparing key program management documents, educating employees, and providing training. However, the HRPO could improve the hardware replacement process by identifying, documenting, and communicating lessons learned.

For example, at one of the sites we visited that began the rollout of its new computers in February 2002, several employees in two business units were negatively affected by the computer replacement. The new computers significantly reduced the employees' Internet research capabilities, thus affecting their ability to effectively complete required duties. A similar situation was reported to IRS executives in December 2001, but it was not communicated to the site before computer replacement occurred.

The Deputy Commissioner for Modernization & Chief Information Officer should ensure post-installation conference calls are held to identify lessons learned during site installations and that lessons learned are formally documented and effectively communicated to future computer replacement sites.

Management's Response: IRS management agreed to the recommendations presented. The HRPO will ensure offices hold post-installation conference calls, and it will update the Lessons Learned document with issues that may affect future site installations. The Lessons Learned document will be available on the Hardware Refreshment web page to all Modernization, Information Technology, and Security Services employees and customers for information.

Management's complete response to the draft report is included as Appendix IV.

Copies of this report are also being sent to the IRS managers who are affected by the report recommendations. Please contact me at (202) 622-6510 if you have questions or Scott E. Wilson, Assistant Inspector General for Audit (Information Systems Programs), at (202) 622-8510.

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## The Hardware Refreshment Program Is Generally Effective, But Improvements Can Be Made

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### Background

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One of the Internal Revenue Service's (IRS) major strategies contained in the *IRS Strategic Plan Fiscal Years (FY) 2000 – 2005* is to provide high quality, efficient, and responsive information services to internal customers. As part of this strategy, the Modernization, Information Technology, and Security Services (MITS Services) FY 2002-2003 Program Plan established that an infrastructure be provided that is sufficiently flexible to adapt to evolving business needs and can be efficiently managed, specifically establishing enterprise-wide technology refreshment (i.e., routine replacement of low-end computer workstations) as an operational priority.

The Hardware Refreshment Program Office (HRPO) of the End User Equipment and Services (EUES) Division is responsible for coordinating and overseeing the planning and implementation of the Hardware Refreshment Program (HRP). The HRP involves the IRS-wide initiative to routinely replace aging personal computers (desktop and laptop computers) with state of the market equipment on a continuing refreshment cycle (currently, 3 years) while reducing the personal computer inventory in the IRS to a ratio of 1 computer per employee. By the end of FY 2003, the IRS expects to have replaced its aging inventory of 150,000 personal computers with approximately 107,000 new (refreshed) personal computers.<sup>1</sup>

In FY 2001, the IRS allocated approximately \$97 million to replace 63,139 personal computers. On May 14, 2001, the IRS held a reverse auction<sup>2</sup> to purchase the replacement computers with installation beginning in FY 2002. The IRS reported that the reverse auction resulted in government savings of 49 percent. The new computers were targeted to replace existing low-end computers with processor speeds less than 400 megahertz. As of June 6, 2002, the IRS had replaced 36,423 (25,875 desktops and 10,548 laptops) of the

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<sup>2</sup> Reverse auctions consist of vendors bidding against each other for the purpose of getting the lowest prices on high-quality equipment.

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63,139 personal computers and plans to replace the remaining computers before the end of FY 2002. For FYs 2002 and 2003, the IRS budgeted \$86.4 million to purchase and install an additional 45,560 computers by the end of FY 2003.

Audit work was conducted in the Information Technology Services (ITS) National Headquarters, the Memphis IRS Campus, the Tennessee Computing Center, and the Denver and Indianapolis Area Offices during the period February through June 2002. This audit was initiated at the request of the Deputy Commissioner for Modernization & Chief Information Officer and was conducted in accordance with *Government Auditing Standards*. Detailed information on our audit objective, scope, and methodology is presented in Appendix I. Major contributors to the report are listed in Appendix II.

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### **The Hardware Refreshment Program Office Successfully Implemented Several Program Management Activities**

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The Office of Management and Budget (OMB) Circular A-130, *Management of Federal Information Resources*, requires the head of each federal agency to effectively and efficiently manage agency information and information technology<sup>3</sup> and to develop policies and procedures that provide for timely acquisition of required information technology.

Overall, the HRPO has done an effective job controlling the hardware replacement process. Program management activities successfully implemented by the HRPO included developing key program management documents, effectively educating affected employees about the HRP, and ensuring that any requested training was provided. The local ITS support personnel were also very supportive of the replacement effort and assisted the HRPO by coordinating site rollout activities and validating the personal computer inventory. As a result, the users at sites visited during the audit were generally satisfied with the overall hardware replacement process.

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<sup>3</sup> Any equipment (to include computers) used in the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by an executive agency.

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### **Key program management documents**

The HRPO developed a comprehensive Hardware Refreshment Program Management Plan to provide structure in planning, organizing, directing, and controlling hardware replacement activities. Although not formally approved, this Plan provides extensive guidance regarding the implementation of a continuous hardware replacement process. The Plan also identifies risks to be considered throughout the replacement process and details the roles and responsibilities of the EUES Division, HRPO, contractor, and local ITS support personnel at the individual IRS sites.

The HRPO also developed a Work Breakdown Structure to identify the major tasks to be performed and to track the status and completion of those tasks. A hardware replacement schedule was also prepared to track and monitor replacement activities at each site. The schedule identifies the computer replacement dates by site and the quantity of desktop and laptop computers to be replaced. The schedule is updated weekly based on information obtained from the installation sites during hardware replacement status meetings and conference calls. For example, the HRPO conducted regular coordination meetings with ITS support and business unit personnel at each site to discuss replacement activities prior to delivery of replacement hardware. In addition, the HRPO conducted daily conference calls with ITS support personnel at each site to confirm the schedule, workspace readiness, and delivery of equipment.

The HRPO also prepared a cost/benefit analysis for the replacement process. The analysis information presented to the OMB compared hardware refreshment scenarios of 3, 4, and 5 years. Based on industry “best practices” and the results of the cost/benefit analysis, IRS management selected the 3-year computer replacement scenario. Lengthening the replacement process to 4 or 5 years was shown to have significant cost impacts. For example, the additional tangible costs for repairs and upgrades were projected to exceed \$74 million under the 4-year scenario and \$100 million under the 5-year scenario. Additional impacts of lengthening the replacement process, which are

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difficult to quantify, included a delay in implementing improvement projects across the IRS and an increase in user downtime.

The HRPO also documented planned benefits, which included providing current technology and standardized software applications IRS-wide and minimizing costs through bulk hardware purchases.

### **Employee education**

The HRPO developed and implemented an extensive Communications Plan that provided for the development and distribution of various internal communication vehicles to educate IRS employees about the HRP. The communication vehicles include web sites, newsletters, brochures, and posters. The local ITS support personnel also communicated the HRP message to the appropriate site management to facilitate educating site employees. At the sites we visited, managers held group meetings to provide HRP information to employees. As a result, employees generally stated that the information they received regarding local HRP activities was adequate and timely communicated.

### **Training**

At the four sites we visited, the desktop computers were replaced with no new functionality or additional applications; therefore, minimal or no training was required by the personnel receiving the new computers. The laptop computers contained new features and the HRPO designated the local ITS support personnel as responsible for providing informal training on the hardware when requested by employees. This training was accomplished through a combination of classroom training, group sessions, and/or one-on-one assistance. Overall, users were satisfied with the training or assistance they received on their new computers.

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### **Identifying, Documenting, and Communicating Lessons Learned Would Improve the Hardware Replacement Process**

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The OMB Circular A-130 requires each federal agency to document lessons learned to ensure that agencies manage information technology in an effective and efficient manner. While several program management activities were implemented to control the hardware replacement process,

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the HRPO did not identify and formally document and communicate lessons learned to ensure the most efficient and effective use of resources.

HRPO management indicated that, at the time of installation, they conduct daily telephone calls to discuss the status of computer replacement at the sites. However, planned post-installation conference calls were not held to identify and track issues and ensure that lessons learned were documented and communicated to offices scheduled to go through the hardware replacement process.

At one of the sites we visited that began the rollout of its new computers in February 2002, several employees in two business units were negatively affected by the computer replacement. The new computers significantly reduced the employees' Internet research capabilities due to the configuration of the Microsoft Internet Explorer software, thus affecting their ability to effectively complete required duties. Representatives of 1 of the business units stated that as many as 300 of the business unit's users nationwide could have been affected by the Internet-related access limitations. Due to the computer replacement limiting the employees' research capabilities, the employees resorted to using their home computers to conduct their work. A similar situation was reported to IRS executives in December 2001, but it was not communicated to the site before computer replacement occurred. An updated configuration of the Microsoft Internet Explorer software that was being tested as of June 3, 2002, is expected to address Internet-related access problems encountered during the hardware replacement process.

By not identifying, documenting, and communicating lessons learned during the computer replacement process, the HRPO risks negatively affecting additional employees at sites scheduled to receive replacement computers. The HRPO stated that it had not formally documented lessons learned because HRPO personnel were informally documenting them through manual notes, but management was unable to provide us a copy of the notes. The HRPO has commented that it plans to begin documenting lessons learned for use in future refreshment hardware rollouts. The

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HRPO cited that another lesson learned that has not yet been documented is to increase upfront communication and obtain earlier business unit involvement at each site in deciding who needs a new computer and whether it should be a desktop or laptop.

### **Recommendations**

The Deputy Commissioner for Modernization & Chief Information Officer should ensure:

1. Post-installation conference calls are held to identify lessons learned during site installations.

Management's Response: After each refreshment deployment, the HRPO will ensure offices hold post-implementation conference calls to officially close the deployment. The HRPO will also create a log to record its post-installation conference calls.

2. Lessons learned are formally documented and effectively communicated to future computer replacement sites.

Management's Response: The HRPO will update the Lessons Learned document with issues that may affect future site installations and ensure the document is available to MITS Services employees and customers on the Hardware Refreshment web page for information. The HRPO will also record in the log when members of its staff update the Lessons Learned document.

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### **Appendix I**

#### **Detailed Objective, Scope, and Methodology**

The overall objective of this audit was to evaluate the effectiveness of the Hardware Refreshment Program (HRP).<sup>1</sup> To accomplish this objective:

- I. We interviewed Hardware Refreshment Program Office (HRPO) staff. We also obtained and reviewed program management documentation including meeting minutes, the Management Plan, Business Performance Reviews, business case information, the Work Breakdown Structure, and the Deployment (Hardware Refreshment) Schedule. We determined the extent of any documented and communicated lessons learned from post-implementation reviews. We determined whether there was a methodology in place to measure and quantify HRP benefits. We obtained and reviewed budget information and documentation.
- II. We reviewed the HRPO's Deployment (Hardware Refreshment) Schedule and a Projected Refreshment Summary detailing the business units at each site and judgmentally selected 4 of 28 sites to visit. We selected the four sites because they had recently completed or were in the process of completing computer replacement activities. In our site selection, we also considered the number and variety of business units projected to receive replacement computers. At each site, we interviewed business unit employees to evaluate the effectiveness of the HRPO's activities related to educating personnel about the computer replacement process and training on the new computers. Finally, we evaluated the effectiveness of the rollout of the new computers and accompanying software in meeting business unit requirements and user needs.

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<sup>1</sup> The IRS-wide initiative to routinely replace aging personal computers (desktop and laptop computers) with state of the market equipment on a continuing replacement cycle (currently, 3 years).

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**Appendix II**

**Major Contributors to This Report**

Scott E. Wilson, Assistant Inspector General for Audit (Information Systems Programs)

Gary Hinkle, Director

Danny Verneuille, Audit Manager

Myron Gulley, Senior Auditor

Mark Carder, Auditor

Linda Screws, Auditor

Tina Wong, Auditor

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**Appendix III**

**Report Distribution List**

Commissioner N:C  
Deputy Commissioner N:DC  
Commissioner, Large and Mid-Size Business Division LM  
Commissioner, Small Business/Self-Employed Division S  
Commissioner, Tax Exempt and Government Entities Division T  
Commissioner, Wage and Investment Division W  
Chief, Information Technology Services M:I  
Director, End User Equipment and Services M:I:EU  
Chief Counsel CC  
National Taxpayer Advocate TA  
Director, Legislative Affairs CL:LA  
Director, Office of Program Evaluation and Risk Analysis N:ADC:R:O  
Office of Management Controls N:CFO:F:M  
Audit Liaisons:  
    Deputy Commissioner for Modernization & Chief Information Officer M  
    Chief, Information Technology Services M:I  
    Director, End User Equipment and Services M:I:EU  
    Office of Program Oversight and Coordination M:R:PM:PO

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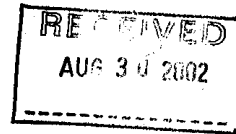
Appendix IV

### Management's Response to the Draft Report



DEPARTMENT OF THE TREASURY  
INTERNAL REVENUE SERVICE  
WASHINGTON, D.C. 20224

AUG 28 2002



#### MEMORANDUM FOR TREASURY INSPECTOR GENERAL FOR TAX ADMINISTRATION

FROM:

*Toni L. Zimmerman*  
Toni L. Zimmerman  
Chief, Information Technology Services

SUBJECT:

Response to the Draft Audit Report – The Hardware Refreshment Program Is Generally Effective, But Improvements Can Be Made (Audit # 200220040)

The Information Technology Services (ITS) organization has begun implementing the Hardware Refreshment Program to bring better technology to employees. The program provides for the replacement of outdated equipment on a three-year cycle with new computers that modernize employee workstations. Employees have a standard, efficient and secure computer desktop environment to run business critical applications and provide more efficient service to taxpayers.

The new laptop and desktop workstations incorporate the best technology on the market. Workstations run office automation applications, a standard set of software, called a "standard image," and have Secure Messaging capability. In addition, Hardware refreshment supports a mobile work environment by providing access to all network services using remote dial-in capability.

In addition, ITS works to protect resources while providing the highest level of customer support. By the end of FY 2003, assuming funding remains available, the ITS organization will have replaced an aging inventory of 150,000 personal computers with approximately 107,000 new personal computers.

The TIGTA audit acknowledged the Hardware Refreshment Program Office (HRPO) has controlled the hardware replacement process effectively. The TIGTA also noted the HRPO successfully implemented several program management activities such as preparing key program management documents, educating employees, and providing training.

The ITS organization will provide formal post-installation conference calls and document lessons learned. This will ensure we officially close future refreshment efforts and document lessons learned on the HRPO web page.

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I included additional details in my attached management response. If you have questions, please call me at (202) 622-0260, or Thomas Mulcahy, Manager, Program Oversight and Coordination Office, at (202) 283-6063.

Attachment

## **The Hardware Refreshment Program Is Generally Effective, But Improvements Can Be Made**

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1

ATTACHMENT

### **Response to the Draft Audit Report The Hardware Refreshment Program Is Generally Effective, But Improvements Can Be Made (Audit # 200220040)**

#### **RECOMMENDATION**

The Deputy Commissioner for Modernization & Chief Information Officer should ensure that:

1. Post-installation conference calls are held to identify lessons learned during site installations.
2. Lessons learned are formally documented and effectively communicated to future computer replacement sites.

#### **ASSESSMENT OF CAUSE**

While we have not held formal post-installation calls, we do have daily conference calls between the Hardware Refreshment Program Office (HRPO) staff and the locations where installations are underway to discuss/document the status of the deployments. We have not formally documented the daily calls and shared the information with other sites. We did informally share information on issues/problems with other refreshment coordinators.

#### **CORRECTIVE ACTION**

After each refreshment deployment, the HRPO will ensure offices hold post-implementation calls with locations to close the deployment officially. The HRPO will update the Lessons Learned document on our web page with issues that may impact other sites/deployments.

The HRPO will make the Lessons Learned document available to all members of the program staff for updating and to all MITS employees and customers on the Hardware Refreshment web page for information.

The HRPO will create a log to record post-deployment conference calls and updates to the Lessons Learned document.

#### **IMPLEMENTATION DATE:**

**COMPLETED:** \_\_\_\_\_

**PROPOSED:** 10/01/02

## **The Hardware Refreshment Program Is Generally Effective, But Improvements Can Be Made**

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2

ATTACHMENT

### **Response to the Draft Audit Report The Hardware Refreshment Program Is Generally Effective, But Improvements Can Be Made (Audit # 200220040)**

#### **RESPONSIBLE OFFICIAL**

Deputy Commissioner Modernization/Chief Information Officer (DCM/CIO) M  
Chief, Information Technology Services M:I  
Director End User and Equipment Services Division (EUES) M:I:EU

#### **CORRECTIVE ACTION MONITORING PLAN**

Based on the refreshment schedule, the HRPO will provide updates to maintain the log. EUES management will review the log post-deployment conference calls schedule and perform spot reviews.